

US STRATEGIC FORCE PLANNING: RESTORING THE LINKS
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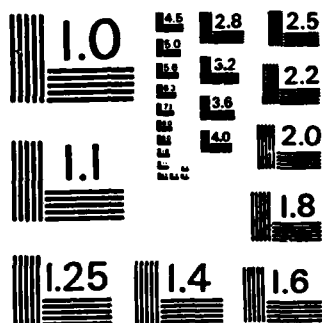
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RESTORING THE LINKS BETWEEN STRATEGY AND CAPABILITIES

Kevin N. Lewis

January 1982

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U.S. STRATEGIC FORCE PLANNING:

RESTORING THE LINKS BETWEEN STRATEGY AND CAPABILITY

Kevin N. Lewis

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January 1982 *

Introduction

Since the early 1970s, the nuclear planning community has gradually come to agree that a strategy emphasizing the flexible and discriminate employment of nuclear weapons is probably the best way to make the U.S. deterrent more reliable and credible. Most strategic analysts now concur that increased flexibility would enable the United States to respond most appropriately to enemy aggression in a nuclear contingency. At the same time, more refined options would provide the best opportunity to prevent a nuclear war from escalating to unnecessarily destructive levels of fighting.

However, serious problems continue to undermine U.S. preparations for a strategy of flexible employment. Compared with previous employment concepts, a doctrine of selective and controlled nuclear use makes substantially greater demands on the performance of some offensive and defensive forces, on the effectiveness and survivability of our command, control, communications, intelligence, and early warning apparatus, and on the agility of our planning systems. These stringent new demands make it essential that employment and structure planning be coherently linked. Unfortunately, there are serious indications that our employment planning policies are seriously inconsistent with our force structure's capabilities. The linkage between our employment and force structure planning activities may even be in danger of complete disintegration.

* The views expressed in this article are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. government.

Already tenuous, the link between U.S. nuclear employment planning and force structure planning has been further weakened by strategic funding levels that have not been able to meet the demands that evolving U.S. strategy has placed on the posture. Despite those new demands, spending on strategic forces during the 1970s amounted to \$11.3B per year, on average (TOA in \$FY80), compared to averages of \$21.1B per year in the 1960s, and \$27.2B in the 1950s. An upturn in strategic funding during the 1980s has now been forecast. Nevertheless, it is not clear that even with planned real budget growth we can afford to modernize all of the presently obsolescent or vulnerable offensive weapons in the inventory--much less provide such important adjuncts to the offensive forces as new intermediate range nuclear forces, improved command-control-and-communications systems, modern active missile, sub, and air defenses, and an expanded civil defense program.

Budget levels certainly help explain why desired strategic capabilities have outrun actual ones, but far more pernicious factors are also at work. Indeed, insufficient funding is not necessarily related to any of the disconnections that may exist within our defense program. Budget constraints, often severe ones, routinely enter into and can be prudently accommodated with deliberations at every step of a soundly linked planning process. Thus, even when funds are inadequate to maintain an incontestably "high-confidence" defense, our planning process should still make sense: that is, although we cannot have everything we might like, our force structure should faithfully serve war plans, which should in turn be based on our designated strategies. But when other factors cause this orderly process to come undone at

either of its nodes, serious problems can result--whether or not funding is deemed adequate.

Ideally, our high-level national objectives (pertaining to fundamental conditions of security and well-being) generate strategies that then dictate employment and acquisition choices. The first and most important disconnection in the planning chain comes between those high-level objectives and the strategies laid down for achieving them. In fact, strategies for nuclear policy planning are necessarily internally contradictory because nuclear planning is obliged to serve conflicting objectives. On the one hand, we have to support our wartime objectives by destroying specific enemy targets efficiently and effectively. But on the other hand, we must not allow fighting to escalate to the point that damage to our society becomes so severe that it invalidates the aims that caused us to enter the fight in the first place. We have not--and probably cannot, even in principle--devise a coherent strategy that reconciles these contradictory objectives.

However, without a single, consistent strategy for the use of nuclear forces, the second key link in the planning chain soon collapses: the link between employment and force structure planning. In the absence of stable criteria for gauging both war and force planning, these two subsidiary activities tend to drift along on disparate courses. Only by chance will we have enough of the right forces to accomplish our nuclear war employment objectives. As the posture and plans drift apart, force decisions independent of higher wartime aims may perforce require revisions in tactical war goals if any degree of coherence among plans and forces is desired. Thus, the inability to say just how nuclear forces can serve national aims leads to confusion and chaos in operational planning.



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Given the awesome consequences that may result from a serious disconnection between posture and doctrine, many planners have recognized that U.S. nuclear force structure and employment planning must be reconnected if we are to stand any chance at all of being able to support a strategy of flexible employment. Former Defense Secretary Harold Brown first publicly noted in his FY79 Annual Defense Report that force planning subsequently would not be undertaken apart from employment planning. More recent statements of U.S. strategy, (e.g. the Carter Administration's "PD-59" and the Reagan Administration's subsequent refinements) also are said to note that force structure decisions should be tied to employment requirements. Clearly, this keen interest in a planning connection is largely prompted by a desire to make sure that our nuclear forces could accomplish the key missions called for by U.S. strategy (such as attacks on Soviet hard targets) and maintain sufficient nuclear capability to destroy important targets throughout a possibly protracted nuclear conflict.

Unfortunately, we have so far picked the wrong approaches for effecting a sound and lasting reconnection, primarily because we have proceeded on the assumption that a set of clear nuclear strategies can be developed straightforwardly from a list of high-level objectives, a theoretically impossible aim. Nonetheless, to force a solution, we try to develop high-level surrogates for use in restoring a connection within the nuclear planning process between the operational components of planning. But to date, the best surrogates that we have developed are the twin objectives of "deterring war" and (should deterrence fail), "pursuing U.S. war aims while controlling the risks of escalation."

Although laudable as overarching statements of principle, such guidance has little practical value. It is very hard, based only on such statements as these, to say just what options should be written or what kinds of forces and how many of them should be bought to back them up.

In sum, such dogma not only is vague, but it embodies the fundamental nuclear objectives dilemma: we still face that fatal planning contradiction between wartime goals and the need to avoid a complete disaster. Lacking authoritative guidance on how to compromise between the warfighting and escalation-control objectives, operational level planners understandably fall back on traditional, arbitrary, planning rules. This is a prescription for trouble. The history of nuclear planning decisively indicates that without specific and consistent guidance, inertia in the posture-in-hand and in budgets will shape other deliberations. We will then witness all of the unhappy results that arise when the operational tail wags the policy dog.

So, the crucial question remains: how can force and employment planning be rationalized in the absence of some grand statement of strategy that reflects high-level objectives? A new technique is necessary for this purpose.

In this paper, I argue for a new planning approach to reconnect force and employment planning that would, without absolute guidance about war aims, enhance deterrence and permit more effective response in the event of nuclear war. This planning approach would:

1. Take realistic account of the strategic forces budget.
2. Consider the competitive effect of force planning on Soviet actions.

3. Be conducted over a long-range horizon.
4. Have sufficient agility to keep the politics of strategic forces from excessively distorting the characteristics of specific programs.
5. Use certain "themes" to shape force employment and acquisition decisions.

The fifth element, the use of force planning themes, marks the quintessential difference between this approach and those used previously. A posture based on such themes would help us to anticipate and respond to possible enemy aggression at levels that could credibly invite a U.S. nuclear response and would make the USSR constantly aware that the gains it hoped to realize through any potential attack would be at least neutralized by U.S. counteraction.

I will discuss these five points in detail. They may seem obvious, but a review of past U.S. force planning experience suggests that, obvious or not, we have not been very faithful to any planning doctrine that vaguely resembles these principles. Thus, the advantages of this new planning approach will be more apparent if we first establish the historical context in which force employment and acquisition policies have become disconnected.

Historic Nature of the Force/Employment Planning Disconnection

Because no useful and generally accepted rules for operational nuclear planning based on reasonable wartime requirements have been developed to date, force planning decisions have been isolated from the employment planning and the contextual factors that ought to modify those decisions. Consequently, planners have found it very difficult to decide how many and what kinds of forces are needed. This has been true throughout the history of U.S. nuclear planning.

Disconnected planning dates all the way back to the origins of U.S. nuclear forces. In the 1940s, proximity to World War II, combined with deficiencies in the U.S. nuclear posture, made it unnecessary to think very carefully about connecting forces with missions. As atomic weapons slowly entered the arsenal, they were straightforwardly assigned to a limited and obvious target list. Furthermore, operational planning was so constrained by technical deficiencies that developing a more sophisticated doctrine would have been useless.

During the 1950s, however, the arsenal grew at a brisk rate. The expansion of the stockpile and the introduction of modern delivery vehicles and improved nuclear explosives made it essential to develop a set of rules for tying the posture to missions. Unfortunately, the United States did not then successfully devise and implement such rules. Rather, the force structure tended to expand for no clear reasons, and weapons were added to a mushrooming target encyclopedia in haphazard fashion. Moreover, contemporary operational doctrine that strongly shaped the posture was independent of factors related to contingencies other than the prevailing one of "general war." Given that doctrine, all U.S. weapons would be launched against their Soviet targets as soon as possible after the onset of hostilities.

This "massive retaliation" force was generally insensitive to any mission requirements other than the few, arbitrary, scenario features indicated in stylized, canonical planning contingencies. As a result, appreciable forces could not, for example, be withheld once general war began, and no provisions were made for essential follow-up strikes or controllable reserve forces. Aimpoint selection was indiscriminate

within a few broad target categories. In short, the decade-long trend was toward a posture that had become internally disconnected. Even the most modest interaction among objectives, budgets, forces, and plans was lacking.

Secretary of Defense Robert McNamara sought to arrest this trend in 1961. United States strategic forces seemed to the new Kennedy Administration to be returning poorly on a large investment. The core of the posture during the 1950s--the manned bomber--not only imposed a large and interminable operational and support burden on the U.S. strategic budget, but the contemporary bomber-centered posture was not, at least as far as McNamara was concerned, well-suited to a strategy of flexibility.[1] Moreover, because 1950s-era missile program designs had been influenced by the doctrinal requirements of massive retaliation, early ICBMs also were not tailored to the operational requirements of flexibility. Some missiles required soft radio command guidance stations and could be launched out of their concentrated bases only one at a time. The missiles were powered by dangerous and unwieldy cryogenic liquid fuels, and it was hard to hold the force at alert. Missile and ground support systems were unreliable, and crews ill-trained. Worst of all, these poorly protected weapons were vulnerable to attack even by grossly inaccurate missiles.

Because new MINUTEMAN and POLARIS missiles were smaller, more easily handled and reliable, and could take advantage of less vulnerable

[1] To McNamara, big bombers were problematic compared to hardened or mobile missiles in a strategy of flexible employment. First, to withhold aircraft could expose them to missile attack. Alerting and hardening methods are expensive, and once the force is launched, it is hard to recover if a go-code is not released. Moreover, it was felt that bomber sorties would be endangered by penetrating Soviet air defenses in less than a massive, defense saturating raid.

basing facilities, they seemed the best force structure additions for the sake of a policy of strategic flexibility. However, due to the strategic bias toward a massive deterrent capability, a true withholding capability was not incorporated into the earliest MINUTEMAN configurations: for example, MINUTEMAN initially could be launched only in squadrons of fifty. (Indeed, the chief advantages of MINUTEMAN's solid fuel booster were not seen then as improved reliability and harder basing; rather, solid fuel ICBMs made possible rapid response, including launch-on-warning.) For a variety of related reasons, many desirable force characteristics were not and, in fact, have not yet been incorporated in the sea-based deterrent.

The issue of flexible employment aside, in 1961, the MINUTEMAN and POLARIS programs were more or less frozen in terms of overall system configuration and size. Even though the U.S. strategic posture in aggregate was dramatically remixed through the early 1960s, the total number of launchers in the force remained roughly constant. Yet while vigorous programs to improve capabilities were also begun, on account of the pace and forms these programs took, the slice of the strategic effort within the total defense program plunged by almost 60% between FY61 and FY66.[2] (However that may be, the shift in defense priorities reflected only the Kennedy administration's emphasis on conventional forces, and not any recalculation of the requirements of strategic deterrence.)

As numbers of relevant Soviet targets began to grow in the mid-1960s, McNamara was pressured to increase the size of the U.S. posture. He attempted to resist these pressures, maintaining that conventional

[2] See this author's How Likely is a Real Increase in Funding for U.S. Strategic Forces? N-1431-FF, The Rand Corporation, December 1979.

force enhancements should have first call on the defense budget. But when there is no logical way to knit up forces and plans with budgets and strategies, posture decisions may largely be made independent of straightforward military requirements. Unfortunately, the only consistently successful route to harnessing fractured elements of strategic planning has been to impose relatively arbitrary restrictions. In this case, it was a force ceiling. Thus, the key purpose of McNamara's device for instituting such a constraint, the declaratory strategy of "Assured Destruction," was to obviate the need for entirely new programs while attempting to meet the evolving threat by, among other things, a policy of incremental force structure updating.

In this way, technical improvements mainly to MINUTEMAN ultimately provided for improved accuracy, coverage, controllability, and some other features called for under flexible employment, without an expansion of the overall U.S. force structure in terms of numbers of launchers. That policy worked splendidly for a while. However, over the past ten years, a numerically expanding and increasingly hard Soviet counterforce target base slowly challenged U.S. capabilities to destroy those crucial targets. At the same time, improving Soviet offensive capabilities--not matched by compensating U.S. actions--made it questionable that many of the right U.S. weapons would be available.

Sized to cover the Soviet urban/industrial target base, POLARIS has not been so menaced. However, because of the failure to provide for adequate accuracy and controllability, sea-based forces may be of limited value in selective and flexible nuclear campaigns. Similarly, while the B-52 force has been steadily improved, the sheer effects of aging, combined with improvements in Soviet air defense and preemptive

defense capabilities, portend the inevitable end of the fleet's useful life. But the crucial fact remains that, in every case the force's capabilities seem to diverge from those of a posture based on a full range of mission considerations, including coverage requirements, alternative scenarios, and possible threat evolution.

In sum, since the early 1960s, budget constraints have nominally shaped the U.S. strategic posture through a policy of incremental modernization of available forces. Some improvements, such as the payload "fractionation" of missile and bomber forces, have, coupled with other advances, increased absolute (if not always relative) U.S. capability against important targets. As of this writing, however, and since 1967 (when the 656th POLARIS and 1000th MINUTEMAN launchers became operational), no new, SALT-countable strategic offensive launcher has joined the active arsenal. Overall force levels have been driven by attrition, primarily in the bomber leg of the TRIAD.

But the sad fact is that while it is true that U.S. offensive forces have been repeatedly and so successfully enhanced qualitatively over this period, possible improvements to the inventory at the margin are necessarily limited. We can MIRV our ICBMs and upgrade the silos, but eventually the enemy will render them inescapably vulnerable. We can put improved missiles in SSBNs and new gadgets and weapons on bombers, but eventually system aging and enemy defensive improvements will combine to make even the best "marginally improved" weapon a cost ineffective proposition. At that point, decisions must be made to procure expensive new weapon systems in order to retain even baseline, status quo capabilities.

Recognizing these facts, in the early 1970s, the services began preparations to acquire several entirely new types of strategic weapons. These systems were not only designed to satisfy more demanding offensive requirements, they were also meant to be effective in the rather different operational environment of the 1980s and 1990s. At that juncture, the opportunity existed to reconnect forces, plans, and strategy. Unfortunately, it seems that this precious opportunity may have been lost. Somewhere in the process of planning the architecture of a new generation of strategic forces, the strategic environment, goals, and tactical war aims that should have figured in force structure analysis were partly overlooked. Unless current plans are substantially revised, U.S. forces for the future may lack such generally accepted attributes as flexibility, endurance, and growth potential.

Recently, as historically, we have allowed the various components of the strategic planning process to go their own ways. Of course, new syndromes of disconnected planning constantly materialize and take the places of old ones. Lately, for example, we have tended to be fascinated with the force planning implications of SALT and other exogenous constraints. Another unhappy recent chapter in the history of the replacement of wartime mission considerations by synthetic force drivers has been the adoption of "the balance" as a basis for force planning. Yet another has been the purported ability of the cruise missile to "cover" for shortfalls in prompt, hard-target coverage forces in the early- and mid-1980s. And, indeed, the overarching criterion according to which forces should be sized seems to have been, until recently, that new systems replace in-service weapons on a one-for-one schedule.[3]

[3] This is apparent if we inspect the original procurement

But though these are different "planning" approaches compared with those of the 1950s and 1960s, they are still symptomatic of a fundamentally disassociated process. So again, disconnections between forces and missions seem to be leading to serious problems. Abandonment of a force and mission linkage not only influences the overall posture, it also shapes individual system configurations to a substantial degree. As a prominent example, failure to provide adequately for the counterforce mission has created current shortages of accurate, prompt weapons to attack a large number of increasingly dangerous and hard Soviet ICBMs. Similar criticisms can be leveled against the failure to devise forces and C³I systems that can be operated or withheld until needed well into a war.

Because of this planning disconnection, the strategic posture of the United States has evolved in a manner unsuited to the security requirements of the nation. Beginning only in about 1977 has an explicit official requirement for reforging coherent force and employment planning processes existed. But, as a consequence of lead times and previous choices made, the situation may very well get worse before it gets better. We face a period of several years in which a dangerous gulf between employment requirements and physical capabilities could exist. All the while, the issue takes on daily greater importance

plans for the three TRIAD elements that were to have replaced B-52s, MINUTEMEN, and the POLARIS/POSEIDON fleet. The original B-1 buy was about 240 aircraft--the same number of planes as there were B-52 G and H mods. Weapons carriage for fully loaded B-52s and B-1s are, moreover, about equal. A 200 missile MX buy, at 10 RVs per missile, represented about the same number of weapons as did the whole MINUTEMAN force. And finally, although 25 TRIDENT submarines amounted to only 600 missile tubes (compared to 656 for the 41 POLARIS boats), the higher on-station rate of OHIO-class boats renders the numbers of alert tubes about equal.

as vital, expensive modernization programs for each leg of the TRIAD get under way. As we select systems, set specifications, and allocate 1980s strategic budgets, we must reassess objectives, too, in the light of a gap between capabilities and needs. Looking to the future, how can we improve U.S. planning performance in this regard?

A New Approach to Force Planning

Clearly, we need a new force planning approach--one that cannot only avoid replicating past planning failures, but one that can bypass the disjunction between high-level objectives and nuclear strategy. As I suggested above, this approach should have the following five characteristics: (1) Force planning must realistically reflect the strategic budget's capabilities; (2) Posture planning should be competitive. Thus, U.S. programs should take into account possible Soviet reactions, for although the USSR seems willing to spend substantially more than we do, their ability to sustain a very ambitious strategic program is not unlimited; (3) Force planning should be conducted over a long-range horizon; (4) Planning should be agile enough to prevent the politics of the strategic forces from dictating the characteristics of specific programs. (Given the sensational nature of nuclear force issues, this task may be the most difficult one); (5) Planning should adhere to certain "force design themes" within the budgetary, political, and other boundaries that shape the size and general mix of the posture.

The Influence of The Budget on Force Planning

The historical record emphasizes that force planning must take into account the realities of the strategic budget. Up to now we have coped with pressures on the posture by making repairs at the margin. Until now, clever force structure adjustment has temporarily warded off potential vulnerability and block-obsolescence crises. Unfortunately, however, the slack afforded by our 1960s-era missile and bomber postures has been almost completely consumed. Yet strategic funding trends have for years been so adverse that we haven't been able to afford brand new systems, and sufficient political support may not be found for a full modernization effort through the 1980s, despite the relatively high priority that the Reagan administration has assigned to these forces. Recent proposals have called for the massive expansion of the U.S. nuclear effort (often on the model of the Kennedy administration's crash missile program). Nonetheless, experience indicates that unless there were substantial, disproportionate increases for all titles in Program One (which would conflict with other crucial defense activities), the strategic budget probably would be deficient for full modernization.[4]

Moreover, simply spending more to solve defense problems is a poor solution. I noted that many ambitious proposals use as a model the Kennedy administration missile buildup. However, this model can be rejected as an anomaly, if only because plans and production lines for key weapons were then active. To undertake major and sudden buildups without adequate consideration of lead-times usually yields less happy

[4] For a detailed discussion of this point, see this author's The Reagan Defense Budget Plan: Prospects and Pressures, P-6721, The Rand Corporation, December 1981.

conclusions, as is well illustrated by the cases of NATO's Lisbon Plan conventional force buildup, the initial Southeast Asian commitment, and the Carter administration's Rapid Deployment Force and Caribbean Command.

Hence, a balanced and sustained program is vital: it may be better to sacrifice heavy "up front" investment if that is the price of an effective and viable program. Evidence also suggests that we should think in terms of missions and requirements in global terms and not view the strategic program as a collection of independent "packets" of weapon systems and related assets.

Not only must programs be complementary in terms of their capabilities; we must also pay attention to follow-on system scheduling so that we do not have several major systems coming up for procurement at the same time, causing a large and probably unaffordable "bow wave." And, the entire program must be costed through with operations, support, personnel, and other "tail," c.f. "teeth," expenses fully represented in plans. For instance, we have to buy as many flying hours as are needed to ensure that we are getting the most out of expensive new bombers. Inflation rates should be set as accurately as possible, because when unrealistic "funny money" estimates are violated, the constant values of the defense outyears are eroded and so additional adjustments to budget submissions--not likely to be very well-received politically--or even worse, requests for supplementals, will have to be endured. The alternative is a program slow-down with the many problems that brings. Finally, because many strategic programs are irrelevant unless they are procured up through some threshold level of capability, we must also be sure that we do some things fully, or else we should not attempt them at all.

Competing with the USSR

A second, related planning tactic, is imposing the heaviest possible financial burden on Soviet strategic planners. As one senior official noted, "We cannot afford to price ourselves out of [the nuclear] competition, nor can we allow our competitors to impose upon us costs that we do not reciprocally impose upon them...In particular, restraint seems less likely to be effective than measures which lure the competitor into using resources as inefficiently as possible in deploying his forces." [5]

The Soviet response to the B-70 provides a rationale for this tactic. The B-70 aircraft never moved beyond prototype status, but the Soviet counter-program, which included the MiG-25 interceptor and SA-5 SAM, has been among the most expensive military efforts undertaken in history. Not only did this program cost the USSR a tremendous sum, but the systems actually deployed were inapplicable to the next generation, low altitude penetrating U.S. threat. Thus, every dime invested in the B-70 might be considered well-spent. The Air-Launched Cruise Missile provides a similar opportunity for competitive posture planning. It necessitates large Soviet air defense outlays that the United States can neutralize by relatively cheap upgrades in the missile's offensive capabilities.

Nonetheless, this tactic must be carefully managed. While an aggressive cost-exchange approach may be attractive in some cases, each side's force structure is the result of many factors. Consequently, we

[5] Andrew Marshall, "Bureaucratic Behavior and the Strategic Arms Competition," Southern California Arms Control and Foreign Policy Seminar Paper No. 5, Santa Monica, CA, October 1971, p. 11.

cannot always be confident that the opponent will program his posture in any given way. Therefore, one key caveat must be placed on this cost-imposing approach. This is that we can easily try "too hard" to devise tricky solutions that could be counterproductive in the long run. For instance, while we acknowledge the advantages of imposing costs on Soviet bomber defenses by means of U.S. prototype aircraft or research programs, cumulative American spending on RDT&E for follow-ons to the B-52 since 1957 would have been sufficient to buy a brand new bomber force.

Further, there is some risk that the U.S. may be picking less than optimal paths along which to try to channel Soviet efforts. We take for granted the efficacy of a highly leveraged approach to force planning. But in many cases, the U.S. has performed so poorly in such competitive cost-effectiveness relationships that we must substantially refine this approach in the future if it is to prove a consistently useful one. Take as an example the United States' failure, between 1967 and 1974, to mount a full counterforce threat to Soviet land-based, offensive missile forces. Among other things, the U.S. decided not to develop a more lethal sea-based threat, not to deploy more MINUTEMAN III, and not to transfer an ICBM follow-on to MINUTEMAN into full-scale development any earlier than 1980, as it turned out. The obvious question is whether a more propitious strategy might have possibly propelled the USSR along more desirable avenues.

One such strategy might have been a concerted effort to drive the USSR out of its own comfortable hard silos into a costly alternative basing system (sea-based or land-mobile), at least before the Soviet counterforce threat to MINUTEMAN reached full maturation. The

generational steps between the SS-6, SS-7/8, SS-9/X10/11, and SS-16/17/18/19 were big ones, and each step was accomplished only at very substantial cost. Had it been forced to deploy a complement of "alternatively based" ICBMs, the operational and fiscal costs to the USSR could reasonably be expected to have amounted to the cost of the offensive improvements achieved between one, and perhaps two, Soviet fixed-based ICBM generations (not to mention retarding gains in accuracy and controllability). Because the USSR was not compelled to make this shift, the Soviet ICBM threat did arrive at the point where marginal improvements to their fourth generation missiles (such as silo hardening and the accuracy improvements now en train) could substantially enhance Soviet warfighting effectiveness at, relatively speaking, very low cost. While the Soviets have for the time being escaped the performance degradations and cost penalties of rebasing their Strategic Rocket Forces, the United States could conceivably (and despite the October 1981 Reagan proposals) wind up putting well over 50% of its ICBM modernization investment budget into the cost of basing and/or direct defense alone.

This account suggests that although we seem to have recognized the advantages of forcing the Soviets into the position of rebasing (during which we could have enjoyed a decade-long breathing spell ourselves), we have allowed the exact opposite situation to happen. Despite our enthusiasm for the concept of "cost-enforcing" deployments, it looks as though we have failed, at least in this case, to respond effectively to former Defense Secretary Rumsfeld's suggestion that "if the life of fixed, hard ICBMs cannot be extended...the United States should not accept a strategic relationship in which we must bear the heavier costs

of alternate basing while the Soviets are allowed the luxury of retaining their fixed ICBMs." [6]

The record points out many techniques for improving our performance in this regard. Competitive programs must be thought through over several moves, and these calculations must take into account Soviet patterns for military decisionmaking. We must also look at certain collateral issues to every program or technology at stake. For instance, some lines of weapons development are very flexible indeed, while others serve very narrow or even single functions. A good example of a set of multipurpose technologies can be seen in modern U.S. cruise missiles which can be adapted to a variety of environments and can undertake many missions. Hence, to the extent possible our programs should attempt to avoid provoking such responses, and should seek to encourage very specialized, "inelastic" technologies (e.g., very large and heavy interceptor aircraft and fixed site SAM and air defense control sites.)

Moreover, the competitive game must be carefully scheduled if it is to succeed. There is no point in fielding challenges that can themselves be neutralized in a hurry or in spending ourselves into the poorhouse to develop very fancy threats, when a simple one (perhaps with long-term improvement potential) will suffice. In sum, we might recall the following excellent advice: "To the extent that there is a complex interaction process [between U.S. and Soviet forces], and we were able to understand it, we might be able through our own program choices gradually to guide the joint evolution of the force posture in directions preferred by the United States." [7]

[6] Donald Rumsfeld, Annual Defense Report, FY78.

[7] Andrew Marshall, op. cit., p. 10.

Planning over a Long-Term Horizon

This brings us to the third principle of a new force planning approach, namely building sufficient long-range flexibility into the posture to, among other things, be able to respond to a broad range of potential developments. Historically there are a few examples of impressive U.S. success in this regard. As noted above, relatively low cost improvements to baseline MINUTEMAN, POLARIS, and B-52 systems have been sufficient to cope with 20 years of often determined Soviet initiatives and at the same time have often placed the burden of procuring expensive countermeasures on the shoulders of Soviet planners. To the extent that Soviet strategic defensive funding is increased, and "dangerous" offensive systems have sometimes been headed off, the track record is not too bad.

But even while the technical slack in the posture is steadily taken up, our plans for brand new systems do not seem to reflect some of the important lessons of the past few decades. In particular, one traditional "lead" enjoyed by U.S. offensive force planners has eroded dramatically--the length of the interval between the U.S. action and the Soviet reply to it. As a consequence, historical, "long look" planning advantages are lost. For example, one analyst observed that because of slippage in MX's Initial Operational Capability, that missile will not be available during the period 1982-87, when it is most needed. Rather, when deployed in the late 1980s, it may face currently unforeseeable problems with new types of ABM.[8] The B-1B is another case in point: even General Ellis, former CinCSAC, pointed out in congressional

[8] Colin Gray, "The MX ICBM Debate," Hudson Institute Paper, HI-2747-P, Croton-on-Hudson, New York, January 1978.

testimony that because of delays in IOC, that bomber might penetrate ably for only a few years given likely Soviet defensive improvements.

Even where no such short- or long-term risks are apparent, some of our programs do not seem well-hedged against unforeseen developments. For instance, given even the remote possibility of dramatic breakthroughs in ASW over the next 25-35 years, we might question the orientation of the Fleet Ballistic Missile program toward large Ohio-class SSBNs as opposed to a mix, say, to include smaller boats with fewer eggs to the basket. Without taking the future into full account, in short, problems with future ABM or ASW gaps would be attributable not only to Soviet advances, but to U.S. decisions of the mid- to late-1970s.

Finally, specific systems may not be well-designed for routine upgrading, historically a very successful U.S. practice. To take just one case, the relatively "dense" designs of some modern bombers do not promise the flexibility for routine modernization and redesign that we have enjoyed with the B-52, just as the complexity of some missiles may trade off with endurance, and heavy payload fractionation may penalize our limited employment capabilities.

In planning over the long-range, once again force plans should be tightly tied to possible future budgets. Our budgets are bound to be sufficiently constraining that we must attempt to get the most return from every program dollar. Yet the requirement for efficiency also demands that we damp fluctuations in the force structure. In other words, abrupt deployment or retirement schedules cannot be tolerated because of the technical sophistication of the U.S. posture, the complexity of the war plans and, some would say, the political repercussions of sudden shifts. This inertia in the posture appears to

be a relatively new phenomenon: between 1958 and 1965, the United States replaced bombers and early generation missiles with new ICBMs and SLBMs at an average rate of about 225 per year. It might be argued that such activity today could be lethal to U.S. declaratory policy, the posture, relations with allies, the SIOP, and the budget.

To prevent such turmoil, strategic investment programs should be carefully scheduled to coordinate development and procurement. If we attempt to do too much at the same time, we will generally have to slow down programs, usually with severe production diseconomies. Incremental improvement possibilities should be built into systems, and a building-block approach--one which accommodates to system add-ons at future dates (like BMD for a new ICBM)--seems to be a good policy. In the area of research and development, developmental and basic technology programs should be carefully balanced. Finally, planning for the future should take into account long-term trends in the support and overhead costs of the force. The costs of manning and flying hours for the bomber centered Strategic Air Command posture of the late 1950s, for example, could not possibly be borne in a balanced Air Force posture today. A shift toward ICBMs permitted a reduction by three-fourths in flying hours and one-half in military personnel.

Managing Political Pressures

A fourth aspect to the new planning approach is the maintenance of some degree of balance between pertinent and military considerations. In other words, that defense management lacks "...Coherency may in large part [be] because coherent management of military forces requires a force plan, or a set of military objectives that are related to foreign policy. From these, it is possible to derive a force structure which in

turn impacts upon organization, tactics, and even military innovations." [9] When either political issues or military issues strongly dominate the other, force planning is bound to suffer. And excessive domination of operational planning by political pressures seems to have marked U.S. nuclear force planning.

Obviously, political concerns have and will continue to profoundly affect the strategic forces. Perhaps the most conspicuous case in point is the deliberate refusal throughout the 1970s to proceed with the development and deployment of more lethal land- and sea-based missiles. For another example, exclusive of our calculated military requirements, we negotiated restrictions into SALT II on certain weapon system attributes (such as missile payload composition). Also, a variety of bomber programs have historically enjoyed powerful political support in Congress and elsewhere, even though heavy reliance on bomber aircraft at some times has seemed inappropriate to a posture emphasizing flexible employment of strategic weapons.

Other examples come to mind. One may be proposed continued adherence to the ABM treaty despite certain promising technical alternatives for the defense of MINUTEMAN during the hiatus prior to MX deployment. Furthermore, in recent years, under the aegis of "essential equivalence," the large numbers of U.S. warheads in the forces (in the POSEIDON boats) have been "traded off" with the higher yields, and increasingly, the lethality of Soviet ICBMs. U.S. concern with mobile Soviet intercontinental missiles, and the perceived value of PERSHING II and GLCM as escalation gap fillers are additional examples of policy issues driven mainly by political, not force and employment, goals.

[9] Jacob R. Stockfish, Plowshares into Swords, Mason and Lipscomb, New York, 1973, p. 65.

Finally, political factors can compel disadvantageous solutions from a cost-effectiveness perspective. One notable example is the once planned deactivation, in FY80 and FY81, of the ten obsolescent and relatively ineffective Washington and Allen class POLARIS SSBNs, which was opposed bitterly for perceptual reasons. Recall also the recent furor over the decommissioning of 54 decrepit TITAN II launchers. (It was felt that these reductions in the U.S. force structure would somehow advertise U.S. "weakness.") Overlooked in all this, of course, was the cost and danger of maintaining the TITANs (spares are hard to find and the missiles have claimed several lives to date), and, in the case of POLARIS, the shortage of nuclear submarine crews, the staggering costs of recoring some of the ships' reactors, and the tremendous improvement in performance coming up shortly in the form of the new TRIDENT subs.

It should also be noted that the requirement to manage outside pressures extends beyond force design into important operational questions as well. For instance, no military planner disagrees that full-up peacetime testing of an integrated weapon system is desirable. But despite interest in complete operational test launches of the MINUTEMAN system, no such experiment has occurred. Only one field test of the MINUTEMAN system has ever been attempted, but the 1965 GIANT LANCE test series was irrelevant and unrealistic. Yet when efforts were made in 1974 to conduct true operational launches (the GIANT PATRIOT test proposed to fire MINUTEMEN on full trajectories to Kwajalein), the plan was scrubbed at the insistence of local political leaders. In each case, political pressures foiled important operational tests.

The nuclear forces attract public and political attention disproportionate, say, to their representation in the budget. This scrutiny--and the effects on the force that are bound to derive from it--cannot and must not be evaded or suppressed. However, experience suggests that one cure will help to dampen unnecessarily wide perturbations in the forces that result from political differences of opinion. Specifically, political influences are more likely to be controllable when a good rationale for a particular program, budget level, or activity is put forward. Accordingly, one way to help forge consensus on strategic force affairs would be through the adoption of a new planning approach such as the one described in this paper and other methods designed to constrain debate (to the extent possible) to practical military questions.

Themes for Force Design

The fifth component of the new planning approach should be the design and use of certain "themes" for force design. As I argued in the introduction to this paper, force planners may never receive definitive and usable guidance on war objectives. Nor is general consensus likely on certain questions of sufficiency, effectiveness, and so on. However, planners can probably agree on several operational force characteristics that could guide both employment and force planning as themes of force design. Of course, the degree to which these characteristics can be introduced into the forces is a function of the budget. However, to the extent allowed thereby, the following themes should form at least a basis for weapon system and overall force planning. For the most part, these themes sound common-sensical. However, current and historical

nuclear postures have rarely betrayed any systematic attempt to apply them, and so it may be worthwhile to set them out here explicitly.

1. Sufficient forces should be protected and be able to retain a high degree of operational effectiveness (even under continuing attack) until such time as the National Command Authority orders their use.
2. Commanders should be able to employ and control forces with the greatest possible flexibility and precision.
3. Forces should be effective: there is no point in using weapons if they have little probability of succeeding in a range of contexts.
4. It is desirable to separate civil society from the nuclear battlefield to the greatest extent possible.

Ensuring Force Survivability and Enduring Effectiveness

Most debate on current weapon acquisition issues revolves around the survivability of U.S. forces. However, survivability must be defined and ensured in a broader context of adequate flexibility. While U.S. and NATO planning has typically been oriented toward a fairly brisk, high-intensity nuclear exchange, some Soviet military commentators have emphasized the concept of protracted general war. Thus, although enduring forces have more demanding technical specifications than forces capable only of prompt response, we need to ensure the prolonged retention of mission capable forces. This is important not only to preserve the fullest range of options for warfighting and war termination but to deter all plausible Soviet military actions taking place well after the commencement of fighting.

For instance, the introduction of expanded options has made some U.S. capabilities, notably our "assured destruction" potential, more of a reserve capability. In this context, the forces involved have

different survivability requirements than they would have as instantly ready deterrent forces. If SSBNs are made more vulnerable by trailing antenna arrays near the surface, then alternative communications media are needed for survivable, not to mention controllable, forces.

In the 1950s, U.S. retaliatory forces were based and alerted on the assumption that as many aircraft as possible would be committed at the very outset of fighting. Provisions for withholding bombers (for instance, by parking them in shelters or revetments) were strongly opposed. While many measures to improve the withholding characteristics of U.S. forces have been undertaken, the overall effort has been inadequate and some capabilities have been neutralized by Soviet action. In general, modern U.S. nuclear force designs remain more or less consistent with 1950s vintage "one (or two) shot" nuclear scenarios. For one example, the electrical power sources that would be needed to sustain MINUTEMAN ICBMs for any prolonged period after a Soviet attack are said to be inadequate.[10] Similarly, the difficulties in managing a dispersed, alerted, or recovering bomber force are well-known.

Technical programs and revised procedures and techniques for holding effective and ready forces at alert throughout a crisis and conflict are at least as important as methods designed to allow a force to ride out a first strike. Such programs would not only enhance the credibility of the U.S. deterrent in Soviet eyes: they could even obviate the need for extra warheads and forces (needed to compensate for virtual attrition in the U.S. arsenal as non enduring systems conk out) and thereby help to hold down Program One budgets.

[10] On the enduring survival question, see T. K. Jones. "The U.S.-Soviet Strategic Balance: Options and Non-Options," Journal of International Relations, Volume 2, Number 3, Fall 1977.

The Need for Control and Flexibility

A second desirable feature of the strategic posture is maintenance of tight control over forces. Furthermore, the posture should be flexible in the light of likely tactical employment requirements. Control and flexibility are closely related attributes. The former implies that U.S. commanders will have at their disposal the necessary command and communications systems to be able to clearly and confidently transmit decisions to forces. The latter requirement demands that once a decision to pursue some line of action has been made, it can be implemented accurately and promptly and in such a manner that, among other things, U.S. intentions will be fairly clear to an adversary. In addition to certain unique resources, both control and flexibility also depend on survivable and enduring early warning, intelligence collection, and attack assessment systems.

As desirable as these characteristics sound, historically they have been lacking in the U.S. posture. The survival prospects of U.S. command, control, and communications (not to mention warning and intelligence) assets have been dubious even for a short war scenario, never mind a protracted one. And U.S. offensive forces traditionally have been designed for massive employment scenarios in which certain operational problems associated with withholding and discriminating employment of forces do not figure very prominently.

Moreover, in addition to problems with withholding controllable and flexible forces are serious operational difficulties attendant upon delivery systems that carry many weapons. An MX with 10 Reentry Vehicles aboard may be most efficient for a large-scale strike against a

comprehensive Soviet target base. But in limited options this combination of large numbers of weapons and their concomitantly smaller footprint for a weight and volume constrained MIRV "bus" might be an inconvenience. The same can be said about the sea-based forces, whose payloads not only are highly fractionated, but which include many launchers in each SSBN. Submarine commanders are understandably hesitant about launching partial submarine loads because doing so exposes their boat. Again, revised procedures are just as important to a strategy of flexibility as are hardware modifications.

Weapon System Effectiveness

Forces should be as effective as possible under reasonable constraints. Technically speaking, this implies that forces should be capable of delivering the right yield with adequate accuracy. Because of the importance to American planners of high-confidence target coverage, any factor which reduces the probability that weapons will perform as desired can lead to demands for large numbers of extra forces to compensate for prospective operational degradations. Indeed, even if the nation were to adopt a "minimum assured destruction" doctrine, fewer weapons would be required to implement the strategy if they were as accurate and reliable as possible within budget constraints.

But in some respects, we have gone in exactly the opposite direction. Only eleven squadrons of MINUTEMAN III were deployed, and a potential counterforce role first for POSEIDON, then for TRIDENT I, was rejected. Political factors partly explain these decisions, but to a significant degree, these forces' designs are due to an analytic and operational orientation toward large "bang bang" scenarios judged by cumulative Damage Expectancy criteria. Similarly, one mainstay of the

U.S. forces throughout the 1980s, the ALCM, is especially subject to penetration uncertainties. It is possible under most circumstances to guarantee certain probabilities of damage against aggregate target types, but it is difficult to be sure whether individual targets will be hit.

The meaning of effectiveness should be revised to take into account new operational requirements that could prove desirable in planning for future nuclear forces. For historical and technical reasons, effectiveness generally has been thought of in terms of the forces' performance against fixed targets. Forces are rated by their ability to meet standardized levels of damage to installations, which is a good way of keeping tabs on the capabilities of the entire arsenal against aggregated target sets. However, overall Damage Expectancy statistics probably are not a good measure in many limited employment scenarios.

Destroying x% of a target system may make sense in the context of a general war campaign. But in limited operations that damage level may not be sufficient, or it may be excessive, depending on the situation. For instance, to destroy a particular type of Soviet communications system, it would be very important to ensure nearly complete destruction of all relevant targets, for the USSR might be able to network together a few surviving installations and thereby completely neutralize the effects of attack. Conversely, if a nuclear strike were designed to support friendly ground forces, it might not be necessary to do much damage at all to, say, all local tank formations: it might be sufficient to simply delay the arrival of those tanks at the battle. If, by "pulling the punch" in this attack, we can hold down collateral fatalities, then such restraint might be all the more worthwhile. The

most important departure that must be made from the traditional meaning of effectiveness, of course, is the development of systems and methods for using forces against targets that are mobile or not precisely locatable, and assessing the effects of such attacks.

Containing Collateral Damage

A fourth planning theme, which may be implemented when it is in the mutual interest of both sides to do so, seems to be in the mutual interest to restrict the collateral damage that can befall the civil populations of both powers (unless, of course, a decision to launch an all-out retaliatory attack has been made). During the 1950s, collateral damage was ignored mainly because although the USSR could devastate our allies, it could not reciprocate a highly destructive attack on the U.S.

But the appearance of Soviet hydrogen weapons and their development of an intercontinental strike force changed this forever. This Soviet expansion partially explains interest among U.S. planners in building a posture capable of attaining relatively refined military goals without ensuring the destruction of what is being defended. For example, in 1955, the CARTE BLANCHE test showed how heavy collateral damage to Europe could be if existing forces and plans were used. Such research on both theater and intercontinental exchanges prompted efforts to develop more discriminating employment plans and weapons.

For more than two decades, it has seemed logical that the degree and nature of the collateral damage done by any contemplated attack should figure into defense planning. Moreover, the need to weigh collateral damage in many respects makes a virtue out of an American necessity, given our traditional failure to adequately provide for civil defense, even in the context of countermilitary attacks.

A Final Caveat

In light of these recommendations, we must again acknowledge that in both force and policy planning powerful budgetary constraints will restrict the extent to which certain capabilities can be introduced into the strategic forces. For example, improved technical performance becomes more costly at an accelerating rate after a certain point. It is one thing to improve sea-based missile accuracies 15%-30% by funding test range, instrumentation, and incremental guidance package improvements. However, to improve accuracies below, say, a few hundred meters, would require major breakthroughs in navigation, control systems, and geodesy and trajectory models for both the missile and the submarine. Clearly, the costs of this effort would be disproportionately greater than that of the less ambitious program.

Similarly, hardening and other improvements to U.S. MINUTEMAN silos is said to have cost \$2 or \$3 billion for the whole force. But to improve silo characteristics much beyond a few thousand psi of hardness would greatly increase that figure. And, while readiness and confidence in strategic forces rely to a great extent on the intensity of our training and test efforts, flying hours and related activities are expensive, and we must expect them to become casualties of tighter strategic budgets. All in all, system and posture design must respect the "knee of the curve."

Summary

A reasonably sound linkage between declaratory and employment doctrine and the capabilities of the strategic posture should always be an essential prerequisite to credible and secure deterrence. In most

areas of military planning, analysis of the general requirements of our strategies can be an effective tool for determining what forces and plans are needed to accomplish selected missions. Because of the difficulty in devising generally acceptable strategies for nuclear employment, however, operational and force planning for nuclear forces have been particularly disconnected from each other. Consequently, the U.S. nuclear posture may be inappropriate for the tasks it may be called upon to perform.

In order to restore a linkage in nuclear planning, some people have recommended that we base force design on requirements deriving from vague "surrogate objectives." However, typical statements of surrogate objectives (the most well-known pair are "deterrence" and "escalation control while pursuing military aims") do not provide a sufficiently concrete basis for force planning. Under the circumstances, ^a more reasonable approach is the articulation and adoption of a set of force design principles and themes. These principles and themes do not themselves describe or determine strategy: instead they increase the likelihood that U.S. commanders will be able to pursue the most promising paths in an emergency. Furthermore, in peacetime, the propriety of the force can be more meaningfully measured by introducing more sophisticated and realistic mission requirements.

The advantages of adopting such a common-sense approach are obvious. First of all, the posture will be able to accomplish effectively and efficiently the missions we set before it. Second, if the relinking of planning elements can be accomplished, nuclear forces can be made to serve whatever aims are considered appropriate by national commanders instead of shaping those aims. Third, it will be

clear under this system which force attributes are reasonable, given U.S. national security goals, and which are not. It will therefore be easier to justify and sustain sensible spending levels, thereby avoiding the budget turmoil that afflicts programs when rationales are not consistent. Fourth, the adoption of a set of force design principles may very well strengthen deterrence, insofar as one dividend of this approach would be enhanced confidence in the forces. Moreover, since Soviet planners most likely will assess our actions, they may be more inclined to take U.S. policy statements seriously if previous force planning provisions explicitly support alleged U.S. intentions.

Answers to key employment and force planning questions--such as what types and numbers of forces are needed in the inventory, and what should be the damage criteria that these forces must satisfy in wartime--ultimately may be subjective. But some basic decisions on military requirements must be made, for if no limits are placed on forces or war plans, the traditional force drivers--among others, the need to maintain an awesome, extremely high-confidence, continuously available urban/industrial attack--will consume excessive numbers of weapons and will in effect divert attention and resources away from other contingencies (such as an extended nuclear war) and other missions (such as prompt, effective attack on counterforce targets or timely strikes against mobile general purpose force targets). Using the procedures outlined here, I suggest, our strategic force planning can be greatly improved.

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